



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,347	12/17/2001	Frederick N. Hause	2000.031300	5747
23720	7590	07/25/2005	EXAMINER	
WILLIAMS, MORGAN & AMERSON, P.C. 10333 RICHMOND, SUITE 1100 HOUSTON, TX 77042			SCHILLINGER, LAURA M	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/023,347

Applicant(s)

HAUSE ET AL.

Examiner

Laura M. Schillinger

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) 13-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Newly submitted claims 44-59 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 44-59 are a separate and distinct species from that of originally elected claims 1-12.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 44-59 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-8, 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishihara ('673).

In reference to claim 1, Nishihara teaches a method comprising:

Providing a wafer comprised of a bulk substrate, an insulating layer positioned above the bulk substrate and a semiconducting layer positioned above the insulating layer (Fig. 5a (1) and Col. 4, lines: 10-15);

Forming an opening in the semiconductor layer and the insulating layer to thereby expose a surface area of the substrate (Fig.5 (b) and Col.4, lines: 15-20)

Forming an alignment mark in the substrate within the exposed surface area of the substrate (Fig.5c (position mark of alignment)) and

Forming a layer of material above the alignment mark in the opening (Fig.5c (5)- upside down position).

In reference to claim 2, Nishihara teaches wherein the wafer is comprised of silicon, and the semiconducting layer is comprised of silicon (Col.Col.1, lines: 5-15 and Col.4, lines: 10-15).

In reference to claim 4, Nishihara teaches wherein forming the opening comprises at least one etching process (Col.4, lines: 15-20).

In reference to claim 5, Nishihara teaches wherein forming the alignment mark comprises:

Forming a patterned layer of photoresist above the exposed substrate area (Col.4, lines: 15-20); and

Performing at least one etching process to form the alignment mark in the exposed area using the photoresist as a mask (Fig.5b and Col.4, lines: 15-20).

Art Unit: 2813

In reference to claim 6, Nishihara teaches wherein forming a layer of material above the alignment mark comprises depositing a layer above the alignment mark and in the opening (Fig.5C (3a)).

In reference to claim 7, Nishihara teaches wherein the material comprises at least one of silicon nitride or oxide and a material having a dielectric constant less than 8.0 (Col.4, lines: 25-30).

In reference to claim 8, Nishihara teaches further comprising performing a planarization operation after forming the material above the alignment mark (Fig.5c (3a- is planar)).

In reference to claim 10, Nishihara teaches wherein forming the opening comprises forming a plurality of openings in the semiconducting layer and the insulating layer (inherent- more than one alignment mark will be formed on a single wafer).

In reference to claim 11, Nishihara teaches wherein forming the alignment mark comprises forming an alignment mark in the substrate within the exposed area of each opening (Fig.5c (3a)).

In reference to claim 12, Nishihara teaches wherein forming the alignment mark comprised a plurality of grating structures in the substrate (Fig.5c (3a)).

Art Unit: 2813

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara ('673) as applied to claims above, and further in view of Ridinger ('219).

In reference to claim 3, Nishihara teaches the above method however fails to explicitly teach wherein the wafer has a diameter of 4, 8, or 12 inches. However, Ridinger teaches a wafer having a diameter in a range of 3 to 6 inches (Col.4, lines: 47-53). It would have been obvious to one of ordinary skill in the art to modify Nishihara's teachings to include a 4 inch semiconductor wafer as taught by Ridinger because Ridinger teaches that wafers with diameters between 3 and 6 inches are considered "standard" (Col.4, lines: 47-53).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara ('673) as applied to claim 1 above, and further in view of Jang et al ('137).

In reference to claim 9, Nishihara teaches the limitations of claim 1, however fails to teach positioning the wafer in a photolithography stepper tool and reflecting a light off the alignment mark formed in the substrate to properly position the wafer for processing in the stepper tool as required by claim 9.

However, Jang teaches a similar method comprising:

Positioning the wafer in a photolithography stepper tool (Col.1, lines:40-45 and Col.7, lines: 15-20);

Reflecting a light off the alignment mark formed in the substrate to properly position the wafer for processing in the stepper tool (Col.1, lines: 40-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nishihara to include the stepper tool and reflection step as disclosed by Jang because as Jang teaches, a photolithography stepper tool is an alignment tool which allows the alignment mark to perform aligning for subsequent processing (Col.7, lines; 10-20)

Response to Arguments

Applicant's arguments filed 5/11/05 have been fully considered but they are not persuasive. Applicant argues that the polysilicon film is conductive and therefore not a semiconductor layer. However one of ordinary skill in the art recognizes that silicon and polysilicon are semiconductor materials, therefore Applicant's argument is not persuasive.

Applicant admits that the poly-silicon layer is etched to form an alignment marking but then argues that this is a failure to teach forming an opening in the polysilicon film. This argument does not make sense; however the Examiner asserts that an opening is formed in the polysilicon film.

Art Unit: 2813

Applicant argues that the alignment mark is not formed on the bulk silicon substrate- the Examiner refers Applicant to Col.4, lines: 5-15- describing the contrary.

Likewise, the same rational applies to the same arguments made regarding the dependent claim rejections.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

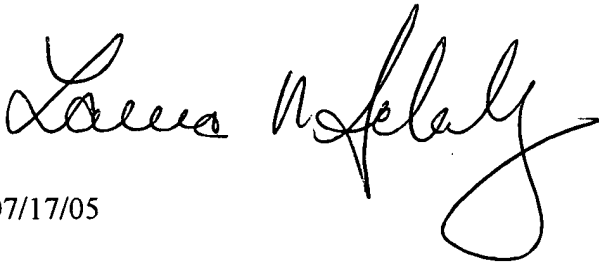
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Laura M. Schillinger". The signature is fluid and cursive, with a large loop at the end of the last name.

Laura M Schillinger
Primary Examiner
Art Unit 2813

07/17/05